We claim:

1. An optical device, comprising:

only one wavelength-selective filter for performing an operation selected from the group consisting of combining a plurality of wavelengths having optical signals in a wavelength-selective manner and separating a plurality of wavelengths having optical signals in a wavelength-selective manner;

said optical signals being routed to repeatedly strike said wavelength-selective filter at respectively different angles such that at each one of said angles, only said optical signals of a specific one of said plurality of said wavelengths are acted upon in a manner selected from the group consisting of being coupled in and being coupled out.

2. The device according to claim 1, comprising:

at least one reflecting surface;

light including said plurality of said wavelengths being reflected to and fro between said wavelength-selective filter and said at least one reflecting surface such that after each reflection from said at least one reflecting surface, said

light strikes said wavelength-selective filter at a different one of said angles.

3. The device according to claim 2, comprising:

a plurality of reflecting surfaces that are configured at an angle with respect to said wavelength-selective filter;

said plurality of said reflecting surfaces including said at least one reflecting surface.

4. The device according to claim 3, wherein: each one of said plurality of said reflecting surfaces are inclined at a different angle with respect to said wavelength-selective filter.

5. The device according to claim 4, wherein: each one of said plurality of said reflecting surfaces are at a different distance away from said wavelength-selective filter.

6. The device according to claim 3, wherein: each one of said plurality of said reflecting surfaces are at a different distance away from said wavelength-selective filter.

7. The device according to claim 1, in combination with an optical waveguide emitting light including said plurality of said wavelengths, the device comprising:

an optical imaging system forming said light into a substantially parallel bundle of light including said plurality of said wavelengths;

each one of said plurality of said wavelengths of said substantially parallel bundle streaming through said wavelength-selective filter at an angle that is different from other ones of said plurality of said wavelengths of said substantially parallel bundle.

8. The device according to claim 7, comprising:

a plurality of detectors; and

a plurality of further optical imaging systems for imaging each one of said plurality of said wavelengths of said substantially parallel bundle onto a respective one of said plurality of said detectors.

9. The device according to claim 8, comprising:

a multichannel interface element;

said plurality of said further optical imaging systems being integrated into said multichannel interface element.

10. The device according to at claim 7, comprising:

a multiplexing element having a surface on which said wavelength-selective filter is configured;

said multiplexing element having at least one further surface forming a plurality of reflecting surfaces that are configured obliquely.

11. The device according to claim 1, comprising:

an optical waveguide being repeatedly led up to said wavelength-selective filter at different angles;

said optical waveguide routing light including said plurality of said wavelengths.

12. The device according to claim 11, comprising:

at least one reflecting surface;

said optical waveguide being routed to and fro between said wavelength-selective filter and said at least one reflecting surface.

13. The device according to claim 11, comprising:

a substrate;

said optical waveguide being formed in an optically integrated manner in said substrate.

14. The device according to claim 13, wherein: said substrate is an integrated optical chip.

15. The device according to claim 13, wherein:

said substrate has a metallized surface forming at least one reflecting surface; and

said optical waveguide is routed to and fro between said wavelength-selective filter and said at least one reflecting surface.

16. The device according to claim 13, wherein: said optical waveguide runs in a curved manner in said substrate such that

said optical waveguide is repeatedly led up to said wavelength-selective filter at said different angles.

17. The device according to claim 13, comprising:

at least one layer running at an angle with respect to said wavelength-selective filter;

said optical waveguide running to and fro in a zigzag manner in said substrate such that said optical waveguide is repeatedly led up to said wavelength-selective filter at said different angles; and

light being routed in said optical waveguide and being repeatedly reflected at said at least one layer.

18. The device according to claim 17, wherein:

said substrate has a surface; and

said at least one layer that runs at an angle with respect to said wavelength-selective filter is formed on said surface of said substrate.

19. The device according to claim 13, wherein:

said substrate has an edge; and

light including said plurality of said wavelengths being coupled into said optical waveguide directly from said edge of said substrate.

20. The device according to claim 13, comprising:

a plurality of optoelectronic converters that are directly coupled to said substrate without additional optics;

each one of said plurality of said optoelectronic converters detecting coupled-out light of a respective separated one of said plurality of said wavelenghths.

21. The device according to claim 1, comprising:

a separate carrier element;

said wavelength-selective filter being formed on said separate carrier element.

22. A method for operating on a plurality of wavelengths having optical signals, which comprises:

performing an operation selected from the group consisting of multiplexing the plurality of the wavelengths having the optical signals by combining the optical signals in a wavelength-selective manner, and demultiplexing the plurality of the wavelengths having the optical signals by separating the optical signals in a wavelength-selective manner; and

performing the operation by repeatedly deflecting the optical signals at respectively different angles onto a wavelength-selective filter such that at each one of the angles, only the optical signals of one specific wavelength are acted upon in a manner selected from the group consisting of being coupled-in and being coupled-out.

23. The method according to claim 22, which comprises:
reflecting light of the plurality of wavelengths to and fro between the wavelength-selective filter and at least one reflecting surface such that after each reflection, the light strikes the wavelength-selective filter at a different angle.